UTS Library

Lesson Plan: Power BI for Digital Humanities

UTS CRICOS PROVIDER CODE 00099F

# Power BI for Digital Humanities

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This lesson was adapted from the following materials:

* “Why data vis is nice” by David Litting, Information Services Librarian

## Class Description

This workshop demonstrates how to create a number of visualisations in Power BI, with a focus on digital humanities.

## Duration

70 – 90 minutes, depending on whether the optional introductory presentation is included.

## Learning Objectives

Participants can:

* Discuss and describe the purposes of data visualisation.
* Clean and prepare a supplied dataset for Power BI Desktop.
* Model geographic data within a supplied dataset.
* Create the following data visualisations:
  + Stacked Column
  + Pie Chart
  + Card
  + Map
* Create the following slicers:
  + Date Slicer
  + Category Slicer
* Use the format tab to alter the aesthetic appearance of visualisations.
* Understand and discuss publishing options for visualisations.
* Describe and discuss the process of transforming and altering historical datasets.

## Room requirements

* Internet access.
* Access to Power BI and Excel software, either on laptops (BYO or supplied) or in a computer lab.
* Presentation facilities (e.g. projector with networked computer).
* Chairs and tables for participants.

## Resources

* Introductory presentation Powerpoint
* Demonstration excel and Power BI files
* Data issues presentation Powerpoint
* Class hand-out
* If desired, note paper and pens
* Laptops or computers (if room does not have them)

## Activities

* Connect an excel sheet to Power BI using the ‘Get Data’ button.
* Remove and split columns using ‘Edit Queries’ and assign data types.
* Create stacked column, card and pie chart visualisations.
* Experiment with different visualisation types
* Model geographic data using the “Modelling” tab.
* Create a map visualization using the modelled data fields.

## Preparation Checklist

* Ask attendees to create a PowerBI account online
* Contact attendees to ensure that PowerBI software has been installed (if using BYO laptops)

## Lesson Plan

Please refer to the hand out for step-by-step instructions.

|  |  |  |
| --- | --- | --- |
| Timing | Topic | Notes |
| 10-15 minutes | **Introduction to data visualisation and Power BI** | This is an optional presentation that can be tailored to your organisation and its interests in data visualisation. For the purposes of this workshop, it outlines the library’s position in regards to data and sets Power BI in the context of other data visualisation alternatives.  If you choose not to use the presentation, consider including:  **Summary of Power BI:** Data visualisation software that allows you to easily prepare and clean data and create visualisations that are easy to tinker with and share, without advanced coding/data wrangling skills.  **Information about the visualisation you are creating:** Give a brief introduction of the dataset you are using as a demonstration, and a brief overview of the kinds of visualisations you will be creating with students in the class.  **An overview of the layout of PowerBI**  Using the demonstration file, show what Power BI looks like and relate it back to other Microsoft products (ribbon across the top), extra tabs like Exceland the different viewing panes on the left hand side (report, data and modelling). |
| 5 minutes | **Connect dataset and clean data** | Students use the demonstration data set and perform the following;   * Download the dataset from a link if necessary (presenter to do this, in something like Google drive etc.). * Connect to the dataset using the ‘get data’ button and importing the Added Categories set) * Direct students to the data pane (click data on left hand side) and click ‘Edit Queries on the top ribbon). * Ensure each column is assigned to the correct type by clicking on the columns and checking the data type. Change any anomalous types (for example, year and date will not be assigned the ‘date’ type yet). * Remove columns ‘ID’, ‘newspapers’, ‘session’, ‘page’, ‘remarks’ and remove ‘year’ but not ‘date’. * Split the latitude/longitude column into two using the split column button, selecting delimiter as the method. Rename both columns to latitude and longitude by double clicking the names of each column. * Students press the close and apply button. |
| 10 – 15 minutes | **Guided creation: stacked column, pie chart and card, formatting, creating slicers** | * Students create a stacked column by going to the report pane (left hand side) and selecting the stacked column icon from the visualisation menu. * Students drag the “date” into the axis’ field and drag “injured or dead” into value (axis and value are under visualisations in the ‘fields’ section). Students click through to the format section (tab next to fields) and change values such as data colour, title (encourage experimentation). Students drag “injury type” into the legend field as an additional layer of visualisation. using the “year” and “injury type” fields, and then add “injured or dead”. * Students create a pie chart using “injured or dead”, by clicking the pie chart button and dragging “injured or dead” into the values and axis fields. Students format the pie chart for colour and title. * Students transform one pie chart into a card chart by clicking the pie chart and then selecting the ‘card’ visualisation instead. * Students add a “Name of Mine” slicer and a “Date” slicer by clicking the slicer button from the visualisations and then selecting one or the other. Be sure to remind them to add two separate slicers. |
| 10 - 15 minutes | **Independent experimentation** | Presenter and helper walk around assisting students to create their own visualisations, experimenting with different types and fields. |
| 5 minutes | **Model Geographic data** | * Students use the modelling tab to alter the data-type of “Name of mine” (change to place), “Region” (change to region), “Latitude” (change to latitude and don’t summarise) and “Longitude” (change to longitude and don’t summarise). |
| 10 minutes | **Guided creation: Map visualisation** | * Students create a new tab in the report section. * Students create a map visualisation by clicking the map visualisation and dragging latitude and longitude values into the latitude and longitude fields. * Students drag “injured or dead” into bubble size. * Students alter the bubbles according to category using slicers. * Students add slicers according to date and region * Students explore location differences between “region” and “name of mine” by dragging them into the location field (latitudes and longitudes summarised or not summarised) |
| 10 - 15 minutes | **Independent experimentation** | Presenter and helper walk around assisting students to create map visualisations and slicers. |
| 10 minutes | **Discussion of data errors, best practice etc.** | Optional presentation that discusses some of the changes and additions that were made to the dataset and the implications for best practice and accuracy. |

## Additional References

## About the Demonstration Data Set

The demonstration example provided with this OER is a transformed work developed from a dataset provided by the State Library of Queensland, available on a Creative Commons Attribution 3.0 Australia license, which allows others to transform and adapt it.

The original dataset:

<https://data.gov.au/dataset/slq-queensland-mining-accidents-1882-1945>

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Changes made to the dataset made were as follows:

* Multiple worksheets included to show progression from original dataset to final version
* Data types altered
* Some columns removed
* Rows with blank latitude and longitude pairs removed
* Some columns concenated
* Array function used to product three new columns; Injured or Dead, Accident Type, Injury Type
* 3 named ranges included as additional worksheet